

**REMARKS**

Claims 30-61 have been examined on their merits.

Claims 62-75 remain withdrawn from consideration.

The Patent Office objects to claims 34, 36 and 50-52 as being dependent upon a rejected base claim. Applicants thank the Patent Office for indicating that claims 34, 36 and 50-52 would be allowed if rewritten in independent form. However, instead of rewriting claims 34, 36 and 50-52 in independent form, Applicants respectfully traverse the prior art rejections for the reasons set forth below.

Applicants herein cancel claims 35 and 56 without prejudice and/or disclaimer.

Claims 30-34, 36-55 and 57-75 are all the claims presently pending in the application.

1. Claims 45 and 46 stand rejected under 35 U.S.C. § 102(b) as allegedly being anticipated by Ishiguro *et al.* (U.S. Patent No. 5,125,066). Applicants traverse the § 102(b) rejection of claims 45 and 46 for at least the reasons discussed below.

To support a conclusion that a claimed invention lacks novelty under 35 U.S.C. § 102, a single source must teach all of the elements of a claim. *Hybritech Inc. v. Monoclonal Antibodies, Inc.*, 802 F.2d 1367, 1379, 231 U.S.P.Q. 81, 90 (Fed. Cir. 1986). A claim is anticipated only if each and every element as set forth in the claim is found either expressly or inherently in a single prior art reference. *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 U.S.P.Q.2d 1051, 1053 (Fed. Cir. 1987). A single source must disclose all of the claimed elements arranged as in the claim. *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9

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U.S.P.Q.2d 1913, 1920 (Fed. Cir. 1989). A proper anticipation rejection requires that every element of the claim be found “in a single prior art reference.” See *In re Robertston*, 169 F.3d 743, 745, 49 U.S.P.Q.2d 1949, 1950 (Fed. Cir. 1999). Thus, the cited reference must clearly and unequivocally disclose every element and limitation of the claimed invention.

Ishiguro *et al.* fail to teach or suggest at least a laser system comprising a rare-earth doped fiber isolated from external environmental conditions in a temperature-controlled enclosure, as recited in claim 45. Ishiguro *et al.* disclose, *inter alia*, an amplifier system comprising a coated fiber that is cladded in such a manner to prevent leakage between adjacent loops of the fiber. Although the Patent Office alleges that Ishiguro *et al.* disclose a temperature-controlled enclosure, the disclosure of Ishiguro *et al.* is limited only to an enclosure (10) that encases the optical light amplifier. See col. 3, lines 56-57 of Ishiguro *et al.* Nowhere is there any teaching or suggestion that the enclosure operates to isolate the fiber (11) from environmental conditions, nor is there any teaching or suggestion that the enclosure is temperature controlled. Referring to Figure 5 of Ishiguro *et al.*, there is no disclosure that the enclosure (10) maintains the temperature and humidity at the listed parameters.

Based on the foregoing reasons, Applicants submit that claim 45 is allowable over Ishiguro *et al.*, and further submit that claim 46 is allowable as well, at least by virtue of its dependency from claim 45. Applicants respectfully request that the Patent Office reconsider and withdraw the § 102(b) rejection of claims 45 and 46.

2. Claim 47 stands rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Ishiguro *et al.* in view of Hicks (U.S. Patent No. 4,730,886). Applicants traverse the § 103(a) rejection of claim 47 for at least the reasons discussed below.

Hicks lacks any teaching or suggestion of at least a laser system comprising a rare-earth doped fiber isolated from external environmental conditions in a temperature-controlled enclosure, as recited in claim 45 and included via dependency in claim 47. Since Hicks fails to cure the deficient teachings of Ishiguro *et al.* with respect to claim 45, Applicants submit that claim 47 is allowable at least by virtue of its dependency from claim 45. Therefore, Applicants respectfully request that the Patent Office reconsider and withdraw the § 103(a) rejection of claim 47.

3. Claim 48 stands rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Ishiguro *et al.* in view of Rahn *et al.* (U.S. Patent No. 4,884,283). Applicants traverse the § 103(a) rejection of claim 48 for at least the reasons discussed below.

Rahn *et al.* lack any teaching or suggestion of at least a laser system comprising a rare-earth doped fiber isolated from external environmental conditions in a temperature-controlled enclosure, as recited in claim 45 and included via dependency in claim 48. Since Rahn *et al.* fail to cure the deficient teachings of Ishiguro *et al.* with respect to claim 45, Applicants submit that claim 48 is allowable at least by virtue of its dependency from claim 45. Therefore, Applicants respectfully request that the Patent Office reconsider and withdraw the § 103(a) rejection of claim 48.

4. Claim 49 stands rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Ishiguro *et al.* in view of Fletcher *et al.* (U.S. Patent No. 4,025,875). Applicants traverse the § 103(a) rejection of claim 49 for at least the reasons discussed below.

Applicants herein amend claim 49 to depend from claim 47, instead of claim 45, so as to provide antecedent basis for the recitation of the second fiber.

Fletcher *et al.* lack any teaching or suggestion of at least a laser system comprising a rare-earth doped fiber isolated from external environmental conditions in a temperature-controlled enclosure, as recited in claim 45 and included via dependency in claim 49. Since Fletcher *et al.* fail to cure the deficient teachings of Ishiguro *et al.* with respect to claim 45, Applicants submit that claim 49 is allowable at least by virtue of its dependency from claim 45. Therefore, Applicants respectfully request that the Patent Office reconsider and withdraw the § 103(a) rejection of claim 49.

5. Claims 30, 33 and 53-55 stand rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Ishiguro *et al.* in view of Kafka *et al.* (U.S. Patent No. 54835,778). Applicants traverse the § 103(a) rejection of claims 30, 33 and 53-55 for at least the reasons discussed below.

Ishiguro *et al.* fail to teach or suggest at least a method of isolating a fiber laser from an external environment in a temperature-controlled enclosure, and operating the enclosure to stabilize the laser repetition rate, as recited in claim 30. Unlike the fiber laser of the present

invention, Ishiguro *et al.* disclose, *inter alia*, an amplifier system comprising a coated fiber that is cladded in such a manner to prevent leakage between adjacent loops of the fiber. Although the Patent Office alleges that Ishiguro *et al.* disclose a temperature-controlled enclosure, the disclosure of Ishiguro *et al.* is limited only to an enclosure (10) that encases the optical light amplifier. *See* col. 3, lines 56-57 of Ishiguro *et al.* Nowhere is there any teaching or suggestion that the enclosure operates to isolate the fiber amplifier (11) from environmental conditions, nor is there any teaching or suggestion that the enclosure is temperature controlled to control a repetition rate of a fiber laser. There is no teaching or suggestion in the combination of Ishiguro *et al.* and Kafka *et al.* of at least a method of isolating a fiber laser from an external environment in a temperature-controlled enclosure, and operating the enclosure to stabilize the laser repetition rate. Since neither Ishiguro *et al.* nor Kafka *et al.* teach or suggest at least these features of the present invention recited in claim 30, Applicants submit that one of ordinary skill in the art would not be motivated to combine Ishiguro *et al.* and Kafka *et al.*

Based on the foregoing reasons, Applicants submit that claim 30 is allowable over the combination of Ishiguro *et al.* and Kafka *et al.*, and further submit that claim 33 is allowable as well, at least by virtue of its dependency from claim 30. Applicants respectfully request that the Patent Office reconsider and withdraw the § 103(a) rejection of claims 30 and 33.

With respect to independent claim 54, Applicants submit that claim 54 is allowable for at least reasons analogous to those discussed above with respect to claim 30. The combination of Ishiguro *et al.* and Kafka *et al.* fails to teach or suggest at least a method of isolating a fiber laser from an external environment in a temperature-controlled enclosure, and operating the enclosure

to stabilize the laser repetition rate. Applicants submit that claim 54 is allowable over the combination of Ishiguro *et al.* and Kafka *et al.*, and further submit that claim 55 is allowable as well, at least by virtue of its dependency from claim 54. Applicants respectfully request that the Patent Office reconsider and withdraw the § 103(a) rejection of claims 54 and 55.

With respect to claim 53, there is no teaching or suggestion in the combination of Ishiguro *et al.* and Kafka *et al.* of a fiber laser wrapped around an acoustically damped spool to stabilize the output of the fiber laser. Ishiguro *et al.* lacks any teaching or suggestion that the bobbin (41) is acoustically damped to stabilize the output of the fiber amplifier. Since neither Ishiguro *et al.* nor Kafka *et al.* teach or suggest at least these features of the present invention recited in claim 53, Applicants submit that one of ordinary skill in the art would not be motivated to combine Ishiguro *et al.* and Kafka *et al.* Based on the foregoing reasons, Applicants submit that claim 53 is allowable over the combination of Ishiguro *et al.* and Kafka *et al.*, and respectfully request that the Patent Office reconsider and withdraw the § 103(a) rejection of claim 53.

6. Claims 31, 35 and 56 stand rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Ishiguro *et al.* in view of Kafka *et al.*, and in further view of Ethridge (U.S. Patent No. 4,212,191). The rejection of claims 35 and 56 is now moot due to their cancellation. Applicants traverse the § 103(a) rejection of claim 31 for at least the reasons discussed below.

Ishiguro *et al.* fail to teach or suggest at least a method for isolating a fiber laser from an external environment in a temperature-controlled enclosure, and operating the enclosure to

stabilize the laser repetition rate, as recited in claim 30 and included via dependency in claim 31.

Unlike the fiber laser of the present invention, Ishiguro *et al.* disclose, *inter alia*, an amplifier system comprising a coated fiber that is cladded in such a manner to prevent leakage between adjacent loops of the fiber. Although the Patent Office alleges that Ishiguro *et al.* disclose a temperature-controlled enclosure, the disclosure of Ishiguro *et al.* is limited only to an enclosure (10) that encases the optical light amplifier. *See* col. 3, lines 56-57 of Ishiguro *et al.* Nowhere is there any teaching or suggestion that the enclosure operates to isolate the fiber amplifier (11) from environmental conditions, nor is there any teaching or suggestion that the enclosure is temperature controlled to control a repetition rate of a fiber laser. There is no teaching or suggestion in the combination of Ishiguro *et al.* and Kafka *et al.* of at least a method of isolating a fiber laser from an external environment in a temperature-controlled enclosure, and operating the enclosure to stabilize the laser repetition rate. The Patent Office further alleges that Ethridge discloses acoustical damping of fibers. However, Ethridge fails to overcome the fundamental deficiencies of the combination of Ishiguro *et al.* and Kafka *et al.* with respect to the temperature-controlled enclosure and operation thereof. Since Ishiguro *et al.*, Kafka *et al.* and Ethridge, either alone or in combination, fail to teach or suggest at least these features of the present invention recited in claim 31, Applicants submit that one of ordinary skill in the art would not be motivated to combine Ishiguro *et al.*, Kafka *et al.* and Ethridge.

Based on the foregoing reasons, Applicants submit that claim 31 is allowable over the combination of Ishiguro *et al.*, Kafka *et al.* and Ethridge at least by virtue of its dependency from

claim 30. Applicants request that the Patent Office reconsider and withdraw the § 103(a) rejection of claim 31.

7. Claim 32 stands rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Ishiguro *et al.* in view of Kafka *et al.*, and in further view of Patterson (U.S. Patent No. 5,818,590). Applicants traverse the § 103(a) rejection of claim 32 for at least the reasons discussed below.

Ishiguro *et al.* fail to teach or suggest at least a method of isolating a fiber laser from an external environment in a temperature-controlled enclosure, and operating the enclosure to stabilize the laser repetition rate, as recited in claim 30 and included via dependency in claim 32. Unlike the fiber laser of the present invention, Ishiguro *et al.* disclose, *inter alia*, an amplifier system comprising a coated fiber that is cladded in such a manner to prevent leakage between adjacent loops of the fiber. Although the Patent Office alleges that Ishiguro *et al.* disclose a temperature-controlled enclosure, the disclosure of Ishiguro *et al.* is limited only to an enclosure (10) that encases the optical light amplifier. *See* col. 3, lines 56-57 of Ishiguro *et al.* Nowhere is there any teaching or suggestion that the enclosure operates to isolate the fiber amplifier (11) from environmental conditions, nor is there any teaching or suggestion that the enclosure is temperature controlled to control a repetition rate of a fiber laser. There is no teaching or suggestion in the combination of Ishiguro *et al.* and Kafka *et al.* of at least a method of isolating a fiber laser from an external environment in a temperature-controlled enclosure, and operating the enclosure to stabilize the laser repetition rate. The Patent Office further alleges that Patterson



discloses a fiber spool that has the same thermal coefficient of expansion as the fibers wrapped around the spool. However, Patterson fails to overcome the fundamental deficiencies of the combination of Ishiguro *et al.* and Kafka *et al.* with respect to the temperature-controlled enclosure and operation thereof. Since Ishiguro *et al.*, Kafka *et al.* and Patterson, either alone or in combination, fail to teach or suggest at least these features of the present invention recited in claim 32, Applicants submit that one of ordinary skill in the art would not be motivated to combine Ishiguro *et al.*, Kafka *et al.* and Patterson.

Based on the foregoing reasons, Applicants submit that claim 32 is allowable over the combination of Ishiguro *et al.*, Kafka *et al.* and Patterson at least by virtue of its dependency from claim 30. Applicants request that the Patent Office reconsider and withdraw the § 103(a) rejection of claim 32.

8. Claims 37-39 stand rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Ishiguro *et al.* in view of Hicks (U.S. Patent No. 4,730,886). Applicants traverse the § 103(a) rejection of claims 37-39 for at least the reasons discussed below.

The combination of Ishiguro *et al.* and Hicks fails to teach or suggest at least a method of reducing timing jitter between two short-pulse lasers by co-wrapping the lasers on a single spool, as recited in claim 37. Unlike the fiber lasers of the present invention, Ishiguro *et al.* disclose, *inter alia*, an amplifier system comprising a coated fiber that is cladded in such a manner to prevent leakage between adjacent loops of the fiber. When Ishiguro *et al.* is combined with Hicks, the resultant device is undesirable for reducing timing jitter between two short pulse

lasers. For example, Hicks discloses, *inter alia*, the coupling of two lasers together. As discussed in the specification of the instant application, even weak optical interaction between two lasers causes the pulses to lock together. *See, e.g.*, page 8, lines 15-27. When the two lasers lock their respective pulses together, dithering is prevented and thus the timing jitter between the two lasers cannot be reduced. Furthermore, there is no motivation within either Ishiguro *et al.* or Hicks that co-wrapping two short-pulse lasers around a single fiber spool reduces timing jitter. Ishiguro *et al.* discloses that the fiber amplifier loops are held to prevent the loops from collapsing, and that the bobbin (41) is used to support the loops. There is no teaching or suggestion in Ishiguro *et al.* that co-wrapping two fiber lasers (as opposed to fiber *amplifiers*) reduces timing jitter between the two lasers. With respect to Hicks, there is no teaching or suggestion that the two fiber lasers are to be wrapped around a fiber spool in any manner, and the optical interaction between the two fiber lasers would prevent the reduction of timing jitter.

Based on the foregoing reasons, Applicants submit that independent claim 37 is allowable over the combination of Ishiguro *et al.* and Hicks, and further submit that claims 38 and 39 are allowable as well, at least by virtue of their dependency from claim 37. Applicants respectfully request that the Patent Office reconsider and withdraw the § 103(a) rejection of claims 37-39.

9. Claim 40 stands rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Ishiguro *et al.* in view of Hicks, and in further view of Hutt *et al.* (U.S. Patent No. 5,717,450). Applicants traverse the § 103(a) rejection of claim 40 for at least the reasons discussed below.

Hutt *et al.* lack any teaching or suggestion at least a method of reducing timing jitter between two short-pulse lasers by co-wrapping the lasers on a single spool, as recited in claim 37 and included via dependency in claim 40. Since Hutt *et al.* fail to cure the deficient teachings of the combination of Ishiguro *et al.* and Hicks with respect to claim 37, Applicants submit that claim 40 is allowable at least by virtue of its dependency from claim 37. Therefore, Applicants respectfully request that the Patent Office reconsider and withdraw the § 103(a) rejection of claim 40.

10. Claims 41, 43 and 44 stand rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Ishiguro *et al.* in view of Rahn *et al.* (U.S. Patent No. 4,884,283). Applicants traverse the § 103(a) rejection of claims 41, 43 and 44 for at least the reasons discussed below.

Ishiguro *et al.* fail to teach or suggest at least a method of stabilizing a fiber laser by isolating the fiber laser from an external environment in a temperature-controlled enclosure, and adjusting the length of a cavity of the fiber laser in response to a temperature change, as recited in claim 41. Unlike the fiber laser of the present invention, Ishiguro *et al.* disclose, *inter alia*, an amplifier system comprising a coated fiber that is cladded in such a manner to prevent leakage between adjacent loops of the fiber. Although the Patent Office alleges that Ishiguro *et al.* disclose a temperature-controlled enclosure, the disclosure of Ishiguro *et al.* is limited only to an enclosure (10) that encases the optical light amplifier. *See* col. 3, lines 56-57 of Ishiguro *et al.* Nowhere is there any teaching or suggestion that the enclosure is temperature-controlled. There is no teaching or suggestion in the combination of Ishiguro *et al.* and Rahn *et al.* of at least

isolating a fiber laser from an external environment in a temperature-controlled enclosure, and adjusting the length of a cavity of the fiber laser in response to a temperature change. The optical path in Rahn *et al.* is a gas path, not a fiber path. Moreover, the cavity length in Rahn *et al.* is adjusted to correct for changes in internal temperature, and not thermal expansion of a fiber laser. Since neither Ishiguro *et al.* nor Rahn *et al.* teach or suggest at least these features of the present invention recited in claim 41, Applicants submit that one of ordinary skill in the art would not be motivated to combine Ishiguro *et al.* and Rahn *et al.*

Based on the foregoing reasons, Applicants submit that independent claim 41 is allowable over the combination of Ishiguro *et al.* and Rahn *et al.*, and further submit that claims 43 and 44 are allowable as well, at least by virtue of their dependency from claim 41. Applicants respectfully request that the Patent Office reconsider and withdraw the § 103(a) rejection of claims 41, 43 and 44.

11. Claim 42 stands rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Ishiguro *et al.* in view of Rahn *et al.*, and in further view of Kafka *et al.* Applicants traverse the § 103(a) rejection of claim 42 for at least the reasons discussed below.

Kafka *et al.* lack any teaching or suggestion at least a method of isolating a fiber laser from an external environment in a temperature-controlled enclosure, and adjusting the length of a cavity of the fiber laser in response to a temperature change, as recited in claim 41 and included via dependency in claim 42. Since Kafka *et al.* fail to cure the deficient teachings of the combination of Ishiguro *et al.* and Rahn *et al.* with respect to claim 41, Applicants submit that



13. Claim 58 stands rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Duston *et al.* in view of Kafka *et al.*, and in further view of Rahn *et al.* Applicants respectfully traverse the § 103(a) rejection of claim 58 for at least the reasons discussed below.

Rahn *et al.* lack any teaching or suggestion of a method of stabilizing a repetition rate of a fiber laser by controlling the temperature of the fiber, as recited in claim 57 and included via dependency in claim 58. The optical path in Rahn *et al.* is a gas path, not a fiber path. Moreover, the cavity length in Rahn *et al.* is adjusted to correct for changes in internal temperature, and not thermal expansion of a fiber laser. Since Rahn *et al.* fail to cure the deficient teachings of Duston *et al.* and Kafka *et al.* with respect to claim 57, Applicants submit that claim 58 is allowable at least by virtue of its dependency from claim 57. Applicants respectfully request that the Patent Office reconsider and withdraw the § 103(a) rejection of claim 58.

14. Claim 59 stands rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Duston *et al.* in view of Kafka *et al.* and Rahn *et al.*, and in further view of Applicant's Admitted Prior Art (AAPA). Applicants traverse the § 103(a) rejection of claim 59 for at least the reasons discussed below.

AAPA is cited only for the purpose of disclosure of a phase locked loop circuit for controlling the average repetition rate of a fiber laser. However, the inclusion of AAPA fails to cure the deficient teachings of Duston *et al.*, Kafka *et al.* and Rahn *et al.* with respect to claim 57. Thus, Applicants submit that claim 59 is allowable at least by virtue of its dependency from

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Ishiguro *et al.* fail to teach or suggest at least a fiber laser isolated from external environmental conditions in a temperature-controlled enclosure, as recited in claims 60 and 61. Unlike the fiber laser of the present invention, Ishiguro *et al.* disclose, *inter alia*, an amplifier system comprising a coated fiber that is clad in such a manner to prevent leakage between adjacent loops of the fiber. Although the Patent Office alleges that Ishiguro *et al.* disclose a temperature-controlled enclosure, the disclosure of Ishiguro *et al.* is limited only to an enclosure (10) that encases the optical light amplifier. *See* col. 3, lines 56-57 of Ishiguro *et al.* Nowhere is there any teaching or suggestion that the enclosure operates to isolate the fiber amplifier (11) from environmental conditions, nor is there any teaching or suggestion that the enclosure is temperature-controlled. There is no teaching or suggestion in the combination of Ishiguro *et al.* and Horiguchi *et al.* of at least a fiber laser isolated from external environmental conditions in a temperature-controlled enclosure. The only reason that Horiguchi *et al.* was cited was that its' abstract contained the word "ambient." Since neither Ishiguro *et al.* nor Horiguchi *et al.* teach or suggest at least these features of the present invention recited in claims 60 and 61, Applicants

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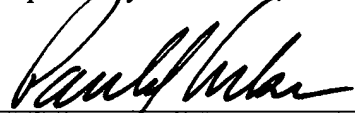
submit that one of ordinary skill in the art would not be motivated to combine Ishiguro *et al.* and Kafka *et al.*

Based on the foregoing reasons, Applicants submit that independent claims 60 and 61 are allowable over the combination of Ishiguro *et al.* and Horiguchi *et al.*, and respectfully request that the Patent Office reconsider and withdraw the § 103(a) rejection of claims 60 and 61.

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

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